T E C H N I C A L M E M O R A N D U M

Utah Coal Regulatory Program

December 19, 2003

TO: Internal File

THRU: Dana Dean, P.E., Team Lead, Senior Reclamation Hydrologist

FROM: Peter Hess, Environmental Scientist III/Engineering

RE Industrial Postmining Land Use Change, Willow Creek Main Facilities, Plateau Mining Corporation, Willow Creek Mine, C/007/0038, Task ID #1771

SUMMARY:

The permittee submitted a proposal to the Division on September 4, 2003 to permit a change in the postmining land use for the main facilities area associated with the mine. This proposal does not include the wash plant area, School House Canyon, Barn Canyon, or Gravel Canyon. A deficiency response was returned to the permittee on October 20, 2003. The permittee submitted a response to the 10/20 document on November 19, 2003. This technical memo will address the adequacy of the permittee's November 19 response.

TECHNICAL ANALYSIS:

RECLAMATION PLAN

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The currently approved postmining land uses are dispersed recreational use, wildlife habitat, and low intensity grazing (See Volume 1, Section **3.4.1.3, General Land Use Patterns of Permit Area and Adjacent Areas,** page 3.4-2 of the Willow Creek Mine, Mining and Reclamation Plan MRP). The Permittee proposes to add an "industrial" use of the surface facilities formerly occupied by the coal production aspect of the Willow Creek operation. The proposal would retain the main administration building and bathhouse, the warehouse building, the shop building, several storage areas located up Canyon of the mine site sediment pond, the propane tanks, the electrical substation, and all roads which are necessary to provide access to each of these facilities. The total area involved is approximately 36.4 acres. A large amount of this acreage could be used for the storage of bulk materials, such as coke breeze, or coal fines, as part of an agglomeration process.

The Division's obligation to the State of Utah is to regulate exploration for, and development of coal in conformance with UCA 40-10 and the Surface Mining Control and Reclamation Act of 1977 which:"……*achieves the successful reclamation of land affected by coal mining activities."*

The Division can approve a change in the postmining land use of the surface facilities area to include "industrial". However, the Permittee must provide positive verification that the "industrial" use is being met (R645-301-413.310). If the Permittee cannot provide adequate verification, then the Division must require the Permittee to completely reclaim the site. Although a **Reclamation Timing and Sequencing** section is included as part of the proposal, (See submittal, page 5.4-3, section **5.4.2.1**), there is not a definite proposal by the Permittee to establish a length of time for which the buildings and the remaining facilities will be allowed to remain unoccupied (R645-301-413.333). To allow the facilities to remain unoccupied for an undetermined length of time is not in the best interest of the Division. However, there is no regulatory authority in place to require a specific period for the establishment of the postmining land use requirements. The Permittee has committed on page 3.4-12, Section 3.4.6.1-Postmining Land Use, to achieve R645 compliance in the following manner; "… should the industrial

postmining land use not be achieved, the Permittee will remove the structures and reclaim the area as represented in the full reclamation (worst case) scenario."

The Division would like to make the Permittee aware that it wants to co-operate in every way to achieve the best utilization of the facilities to help the Permittee, as well as enhance the potential for economic development in the Carbon County area. However, it should also be noted that the Division has repeatedly heard how anxious RAG/Plateau Mining Corporation is to remove its operations from the State of Utah. In light of the current economic conditions within the Carbon County area, this anxious attitude has created concern within the Division. Without a regulatory requirement to establish a timeline for the "achievement of a successful postmining land use", the Division must rely on the integrity of the Permittee and their commitment to meet the requirements of the R645 coal rules. This commitment, in conjunction with the fact that the Division will hold the reclamation bond until reclamation is complete, or the postmining land use is implemented must be accepted as adequate to meet the minimum requirements of the R645 coal rules.

The previous submittal contained no discussion relative to the type of proposed "industrial" land use that the Permittee would allow to be implemented. "Industrial" was determined to be too general of a term. In order to meet the requirements of the coal rules, the proposed industrial use must not be impractical or unreasonable, (**R645-301-413.331**). The Permittee's November 21 submittal contains revised verbiage to address the aforementioned on revised page 3.4-12. The proposed "industrial" land use designation would, upon Division approval, and a determination of acceptable use by the Carbon County Planning and Zoning Commission, allow heavy or light manufacturing, fabrication, repair, rebuild, or assembly of mining equipment, storage capability for product(s), as well as office space for private or government entities. As the County Building and Zoning Commission would control the issuance of use permits, the likelihood of an entity acquiring a use permit for an environmentally unfriendly business is nil.

Findings:

Information provided in the application is adequate to meet the minimum Postmining Land Uses requirements of the regulations.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The approved reclamation plan addresses the complete and total reclamation of the main mine facilities area. The Permittee is proposing to add an "industrial" classification to the postmining land use criteria, so the mine facilities can remain as an industrial complex.

This industrial classification would allow the Permittee, upon Division approval, the justification to leave the three buildings associated with the mine, (the bath house/administration building, the warehouse, and the maintenance shop facility) in-place and functional. The maintenance shop facility is considered by most individuals to be the most valuable of the three; however, the building sits in close proximity to the highwall area, which the Permittee is proposing to reclaim to the pre-mining condition.

The submittal contains MAP 22A, which shows cross sections of the areas to be reclaimed post-mining/pre-industrial. Sections L-L', M-M' and N-N' depict the cross sections to be established by the fill material as it is placed to reclaim the portal area, (Reclaim Area 2). A review of these sections reveals that the slopes will be established at the following gradients: 1.85/1, 2.3/1, and 1.84/1 respectively. Map 22A also depicts the surface configuration of the land on the same cross sections prior to the Willow Creek Permit.

In order to meet the requirements of AOC, the Permittee must return the highwall area to approximately the same configuration that existed before the Willow Creek Permit was issued. Cross sections L-L', M-M', and N-N' only propose to backfill the area behind the shop to an elevation which is approximately twenty-one feet lower than the pre-Willow Creek Permit surface configuration (green line), however the contour is closely approximated and the same amount of highwall is eliminated. If this alternative postmining land use is implemented, the buildings will remain indefinitely.

If the industrial postmining land use cannot achieve successful implementation, the Permittee is committed to full reclamation of the site, including the return to approximate original contour, as depicted in cross sections B-B' and C-C' (See MAP 22A) Postmining Cross Sections – Full Reclamation Alternative. The reclamation configuration depicted on these varies from zero to twenty feet lower in elevation than the pre-mining configuration, but the pre-mining or original surface configuration is very closely depicted. Thus, the Permittee has addressed the minimum regulatory requirements.

The previous submittal did not specify design criteria for the placement and compaction of fill in the portal reclamation area. The Permittee has addressed this requirement by adding revised text submitted as page 5.4-15. In order to achieve the minimum static safety factor of 1.3, the fill will be placed in twelve-inch lifts; compaction will follow via utilization of a sheep's foot compactor.

The submittal does not state where the fill material will be obtained to backfill the Willow Creek Mine portal area.

MAPS 21A and 18C do not correlate in the respect that MAP 21A and cross section K-K' (depicted on MAP 22A) show that the pad area which was previously occupied by the main ventilation fan / heaters and storage area will be reclaimed as part of the industrial postmining land use. MAP 18C depicts this area as being part of the storage area to be retained for the industrial postmining land use. The Permittee's November 21 deficiency response has confirmed that the Mine's fan pad / storage pad area will be reclaimed to the final surface configuration contours depicted on MAP 21A.

Findings:

Information provided in the application is adequate to meet the minimum Approximate Original Contour Restoration requirements of the regulations.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

General

The Permittee's initial application did not contain specific backfilling and grading design criteria for the portal reclamation area. The Permittee has addressed this by providing additional information in a revised page 5.4-15. The reclaimed slope will have a concave profile. In order to provide a minimum amount of room on the north side of the shop building such that ingress/egress through the shop doors will be possible for large machines, the final surface configuration of the "industrial" postmining land use highwall will be steeper than 2H:1V. This is necessary to eliminate the high wall to the elevations achieved by the AML reclamation. Examination of the geotechnical investigations provided by Rollins, Gunnell and Brown during the pre-construction phase (Exhibits 11 and 22) of the Willow Creek Mine indicates that the engineering characteristics of the native soils in the Willow Creek area will allow reclaimed slopes to achieve gradients of 1.3H/1V and retain a minimum static safety factor of 1.3.

According to revised page 5.4-15, "the proposed reclamation slope for the portal highwall is concave in profile with a maximum slope of 1.5H / 1V for the top 15 to 20 feet of the slope. The designed slope will be stable with a minimum safety factor of 1.3. To ensure that the minimum safety factor is met for this fill, the soil material will be placed in approximately 12 inch lifts and compacted with an 814 or equivalent sheepsfoot compactor. Moisture will be

added to the soils as conditions warrant (to enhance compaction). The last 15 to 20 feet of the slope will be placed by excavator due to limited space. The limited space will also make the use of compaction equipment unsafe. The compaction of the soil at the top of a slope is not critical to the slopes overall stability and not compacting this zone will not affect the long term stability of the slope." The Permittee's November 21 submittal meets the minimum regulatory requirements for backfilling and grading, **R645-301-553**.

A review of the approved mining and reclamation plan, Volume 1, Chapter 5, section 5.4.2.2 Reclamation Plan, page 5.4-14 refers one to Exhibit 11 of the plan, which consists of the geotechnical investigation performed by Rollins, Brown and Gunnell for the development of the Willow Creek Mine site. Page 5.4-14 states the following:

> *"Generally, backfill material will be placed in relatively uniform lifts and will be compacted by normal equipment traffic. Backfilled areas will be sloped and graded to promote effective drainage and to the extent of the operational feasibility. Fill slopes will be limited to a maximum slope of approximately 3H:1V…and graded slopes in native material will vary dependent on material from less than 5H:1V to as much as 0.5H/1V in competent rock consistent with slope stability considerations as documented in Exhibit 11, Geotechnical Investigations. Recommended slope limitations for final cut and fill slopes will result in slope configurations having a static safety factor of at least 1.3. The design safety factor for any benched slopes is 1.5…In limited areas where reclamation slopes will be tying into undisturbed slopes, the reclamation slope will be up to 1.1H/1V. The slopes at greater than 2H:1V will be of limited length and width and will only be a small portion of the reclamation slope. A slope stability analysis was performed on the longest reclamation slope, which also contained a section with the maximum proposed slope."*

The slope stability analysis is found in Exhibit 22. The slope stability analysis established a minimum factor of safety for the reclamation slope of 1.3 that complies with the minimum requirements of R645-301-553.130.

Page 6, paragraph "F" of section IV of the Rollins, Brown and Gunnell report contained as Exhibit 22 discusses **CUT AND FILL SLOPES.**

> *"Stability analyses of cut and fill slopes in the colluvial and alluvial materials have been made based upon observation of existing slopes in the soil in the vicinity of the site, the boring data, and the results of laboratory tests. Stability analyses have been performed using a computer model of Spencer's Method. Spencer's Method satisfies both force and moment equilibrium and is considered to be a satisfactory procedure for solving limiting equilibrium problems. The computer model used follows the procedure developed by Wright at the University of Texas for the U.S. Corps of Engineers."*

"Based upon the results of stability analyses, the following general recommendations are made with respect to cut slopes in the natural colluvium or alluvial materials. Cut slopes of 1.5 horizontal to 1 vertical or flatter can be used for cuts less than 20 feet in height, if positive drainage is provided to prevent saturation of the slopes. For cuts in excess of 20 feet in height, cut slopes of 2 horizontal to 1 vertical or flatter should be used."

"Fill slopes constructed with on site granular soils or coal refuse and densified to at least 90% of ASTM D1557 should be designed with a maximum slope of 2 horizontal to 1 vertical. Surface water diversion channels should be constructed along the crest of all cut and fill slopes to prevent water from running over the face of the slope."

The reclamation gradients depicted on MAP 22A, POSTMINING CROSS SECTIONS, INDUSTRIAL POSTMINING LAND USE CHANGE ALTERNATIVE all depict slope gradients less than 2H/1V. Therefore, the reclamation slopes being proposed meet the requirements of the RB&G slope stability analysis for maximum gradient. Compaction requirements have been addressed.

The RB&G slope stability analysis is P.E. certified by Mr. Brad Price, a registered professional engineer in the State of Utah.

Findings:

Information provided in the application is adequate to meet the minimum Backfilling and Grading requirements of the regulations.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

The submittal for the postmining land use change contains a proposal to change the method of permanent abandonment for the four tunnel openings associated with the long and short tunnels that provided the route through the hillside for the overland conveyor. The currently approved plan calls for the construction of solid block seals utilizing eight inch solid block, wet wall construction with pilaster, as necessary as described on page 5.4-9, **Stabilization and Sealing of Mine Openings,** paragraph two, and in ***FIGURE 5.4-3, TYPICAL PORTAL SEAL.*** The November 19, 2003 submittal contains a revised ***FIGURE 5.4-3, TYPICAL***

PORTAL SEAL, which indicates that this type of permanent concrete block seal will not be installed in the rock tunnel openings. A reclamation bond in the amount of $50,000 has been established and is in place for the construction of the four tunnel seals (concrete block construction).

The proposal relative to permanent abandonment of the four tunnel openings is to backfill the openings in accordance with 30 CFR 75.1711-2, as required by MSHA. It needs to be noted that when the tunnels were explored during the very first development stages of the Willow Creek Mine in 1994, **the tunnels had seals installed in them**. The date of sealing / installation of those seals is not known.

R645-301-529.100 states that … "or other exposed underground opening will be…or otherwise managed as approved by the Division. If these openings are uncovered or exposed by coal mining and reclamation operations within the permit area **they will be permanently closed** …**or otherwise managed in a manner approved by the Division."**

R645-301-551, states the following; "…**each** shaft, drift, adit, **tunnel**, or other opening to the surface from underground will be capped, **sealed and backfilled**, or otherwise properly managed, as required by the Division and consistent with MSHA, 30 CFR 75.1711. Permanent closure methods will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery…".

The Division feels that the phrase sealed and backfilled, is two verbs requiring two actions, i.e., 1) sealing by the construction of eight inch solid block seals, mortared joints, with pilaster if necessary, with a plastered face, and 2) backfilling the entry for a distance of at least twenty-five feet with incombustible material. The permittee's proposal is to seal the tunnels' openings by backfilling only. The tunnels are not associated with any coal seam, and the likelihood of combustible gases or water accumulating behind them is nil. However, the method of sealing must be adequate to prevent, to a reasonable extent, unauthorized access. The Division is willing to accept the backfilling of the four tunnel openings as a permanent seal, if the following criteria are met during the backfilling process;

1) the noncombustible material must be placed at least twenty-five feet into the tunnel, and the material must be placed clear to the roof line, and compacted in such a manner as to minimize settling of that material to a maximum reasonable extent.

2) The placed material must be compacted, as it is placed, in order to minimize settling from the roof line. This process must be performed for the entire twenty-five foot length of the noncombustible fill.

3) The permittee must notify the Division when the backfilling process is initiated, such that the Division can monitor that the seals are being constructed to be as permanent as can be reasonably expected.

MAP 21 D, which was part of the original submittal, depicts the four areas above each of the four tunnel openings as *pre-SMCRA highwalls which are to be retained.* Thus, the currently approved plan indicates that **additional fill will not be placed over the openings** to return them to approximate original contour.

The Division must maintain the opinion that the best method to permanently seal the tunnels, to the maximum reasonable extent, is by the construction of the solid block seals, followed by backfilling. However, if the permittee feels that the backfilling of the tunnels is adequate to seal them, then the Division **must require the permittee to place additional material at the opening of each tunnel, such that a final surface configuration of 2H:1V is achieved here.** This will ensure that the settling of the fill within the tunnels will not provoke the curiosity of unauthorized individuals, and that a reasonably permanent seal has been achieved at each of the four tunnel openings.

Findings:

Information provided in the application does not meet the minimum Mine Openings requirements of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-551. Casing and Sealing of Underground Openings. The proposal to backfill the tunnel openings is inadequate, as it does not describe the methods which will be used to stow and compact the backfill seals to make them as reasonably permanent as possible. The Division needs a commitment from the permittee to place additional material over the tunnel openings, such that a 2H/1V final surface configuration is achieved over the opening, ensuring a reasonably permanent seal.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Affected Area Boundary Maps

MAP 18C, which has been submitted with the proposal, accurately delineates the portion of the mine site disturbed area which will not be reclaimed, and which will be designated as having an "industrial" postmining land use capability, upon Division approval of the amendment. MAP 18C does not correlate with MAP 21A, in that 21A depicts reclamation contours on the main pad and outslope of the area occupied by the mine's main ventilation fan (Reclaim Area 1). Cross section K-K' (depicted on MAP 22A, POSTMINING CROSS-SECTIONS, INDUSTRIAL POSTMINING LAND USE CHANGE ALTERNATIVE) also depicts reclamation work in the fan pad area, achieving a concave surface shape having an overall slope gradient of 5H/1V. The permittee has determined that the fan pad will be reclaimed. Therefore MAP 18C must be revised, re-certified and re-submitted.

Bonded Area Map

The area to be bonded, as part of the industrial postmining land use, is depicted on MAP 18C.

Reclamation Backfilling And Grading Maps

The proposal contains final surface contour maps as MAPS 21A, 21B, 21C, and 21D. MAP 22A contains cross sections relevant to all of the proposed reclamation areas (areas being proposed as part of the postmining industrial designation do not have cross sections). All maps mentioned here contain information relative to POSTMINING CROSS SECTIONS, FULL RECLAMATION ALTERNATIVE in addition to the information provided for the INDUSTRIAL POSTMINING LAND USE CHANGE ALTERNATIVE. All maps are P.E. certified by a State of Utah registered professional engineer.

Reclamation Facilities Maps

Map 18C identifies all structures which are to be retained as part of the proposed industrial postmining land use.

Final Surface Configuration Maps

See Reclamation and Backfilling Grading Maps.

Certification Requirements

The following maps have been P.E. certified by Mr. Layne Jensen, a professional engineer registered and certified by the Utah Department of Commerce, Division of Occupational and Professional Licensing; MAPS 6, 9, 18A, 18C, 21A-D, 21 G, 22A, and 22D.

Findings:

Information provided in the application does not meet the minimum Technical Data Reporting requirements of the Regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-542.320, MAP 18C must be corrected to reflect the reclamation of the Mine's fan pad/equipment storage area. MAP 18C must also be re-certified, and re-submitted.

RECOMMENDATIONS:

The permittee must address the previous deficiencies before a recommendation for approval can be made.

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